**Acute Myelomonocytic Leukemia**

**Demonstration of Pulmonary Involvement by Bronchoalveolar Lavage**

Giovanni A. Rossi, M.D.; Bruno Balbi, M.D.; Marco Risso, M.D.; Mario Repetto, M.D.; and Cesare Ravezzoni, M.D.

Massive pulmonary infiltration by leukemic cells resulting in respiratory symptoms is a rare complication of acute leukemia. We report the findings in a patient with acute myelomonocytic leukemia presenting with acute onset of fever, dyspnea, and nonproductive cough, in whom the diagnosis of pulmonary invasion by leukemic cells was made by cytochemical analysis of bronchoalveolar cells recovered by lavage.

Pulmonary complications in patients with acute leukemia may be caused by infections, heart failure, hemorrhage, chemotherapy, radiotherapy, and, rarely, by leukemic infiltration of the lungs. Because of the wide range of possible etiologic factors and the toxicity of many drugs used for the treatment of pulmonary complications, it is important that a specific diagnosis be made. Fiberoptic bronchoscopy has been proposed as a relatively safe technique in the diagnosis of pulmonary lesions in this group of patients, who are usually at high risk; however, among the bronchoscopic techniques, bronchoalveolar lavage has not been reported as a tool for the identification of leukemic cells within the alveolar spaces.

We herein report a case of acute myelomonocytic leukemia, presenting with fever and bilateral pulmonary infiltrates, in which the diagnosis of leukemic infiltration of the lung was demonstrated by cytochemical analysis of the cells recovered by bronchoalveolar lavage.

**Case Report**

A 64-year-old previously healthy white woman was referred to the Pulmonary Department of San Martino Hospital of Genoa, Italy, with a ten-day history of fever, dyspnea, and nonproductive cough. The temperature was 38°C (100.4°F), the pulse rate was 98 beats per minute, the blood pressure was 140/80 mm Hg, and the respiratory rate was 25 breaths per minute.

The findings from physical examination were unremarkable, except for a few coarse crackles over the lower fields of both lungs and a mild splenomegaly. The hemoglobin level was 7.6 mg/100 ml, the hematocrit reading was 23.4 percent, and the white blood cell count was 49,000/cu mm, with 17 percent neutrophils, 17 percent lymphocytes, and 66 percent blast cells. The platelet count was 19,000/cu mm. The chest x-ray film revealed the presence of nodular and patchy shadows of homogeneous density in the middle and lower fields of both lungs (Fig 1). A diagnosis of acute myelomonocytic leukemia was made on analysis of peripheral blood and bone marrow biopsy. In order to identify the cause of the pulmonary lesions, fiberoptic bronchoscopy was performed; bronchoalveolar lavage was carried out with five applications of 20 ml of sterile physiologic saline solution in a subsegmental airway of the right middle lobe, and bronchial brushings were obtained in the right and left lower lobes.

*From the 1st Divisione di Pneumologia and Divisione di Ematologia, Ospedale San Martino, XIII USL, Genoa, Italy. Supported by grants 83.00469.04 and 83.02804.86 from Consiglio Nazionale delle Ricerche, Rome. Reprint requests: Dr. Rossi, 1° Divisione Pneumologia, Ospedale San Martino XIII USL, Genova, Italy 16132*
Acute Myelomonocytic Leukemia (Rossi et al)

Discussion

Pulmonary symptoms in patients with acute leukemia are usually the result of infections or hemorrhage, rather than of leukemic infiltration of the pulmonary parenchyma.\textsuperscript{1,2} The usual roentgenographic pattern of leukemic pulmonary involvement, which is more frequently associated with acute monocytic leukemia than acute lymphocytic leukemia,\textsuperscript{3,7} is a diffuse bilateral reticulation resembling that of lymphangitic carcinoma. Local opacities and nodular lesions are extremely rare.\textsuperscript{1,8} Morphologically, the infiltration of the lung is characterized by invasion of the alveolar septa, compressing the capillaries and, sometimes, the alveolar spaces, and by focal collections of leukemic cells around small bronchioles and vessels.\textsuperscript{1,3,7}

In this context, our patient had an unusual presentation of her disease, with acute onset of respiratory symptoms and diffuse chest roentgenographic abnormalities, including nodular lesions and patchy opacities. Since the patient had a low platelet count and abnormal clotting tests, we elected not to perform transbronchial biopsies required for examination of pulmonary tissue, and we used bronchoalveolar lavage to study the cells present in the alveolar spaces.

Leukemic cells were detected with the latter procedure, and the alveolar blast crisis infiltration was proven by cytochemical analysis. This case suggests that bronchoalveolar lavage should be included among the bronchoscopic procedures used for the evaluation of pulmonary abnormalities in patients with acute leukemia.

References